

THRIPS AND THEIR HOST PLANTS: NEW AUSTRALIAN RECORDS (THYSANOPTERA: TEREBRANTIA)

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Abstract

This list updates the 1996 ABRS Zoological Catalogue, with 7 genera and 14 species of Terebrantia not recorded previously from continental Australia, together with a further 18 species recorded from Australia since publication of that catalogue, newly established larval host plant relationships for a further 12 species and range extensions for some others.

Introduction

The information presented here emphasises two problems in our understanding of the Australian insect fauna. The northern tropical zone of this continent either shares a considerable thrips fauna with territories to the north, or is currently susceptible to extensive invasions from those territories; we cannot know which, given the present lack of base-line data. Moreover, our understanding of the Australian fauna has been outstripped by taxonomic descriptive activity. Collecting and describing new taxa is easy; understanding the position of those taxa in ecosystems and thus how they interact in the maintenance of biological diversity is both more difficult and more important. The purpose of the following notes is to record 14 named species that have previously not been recorded from Australia (indicated *), to list a further 18 species (indicated #) that are not given in the ABRS Zoological Catalogue (Mound 1996a) but have been recorded in various subsequent publications, to record newly recognised host-plants for a further 12 species and to note some nomenclatural changes and range extensions. An electronic listing, revised to December 2000, is available at <http://www.environment.gov.au/abrs/abif-fauna/chcklist.htm>

In recording a total of 170 species of Thysanoptera Terebrantia from Australia, in 61 genera and three families, Mound (1996a) stated that the fauna seemed to be poorly known, the list being dominated by introduced taxa. Most of the native species were known only from single samples, even single damaged specimens, so that no information was available on host-plant relationships or distribution patterns. During the last five years, an extensive research programme on the Thysanoptera Tubulifera associated with *Acacia* phyllodes (Mound and Morris 2001) has resulted in the largely fortuitous accumulation of much information on species of Thysanoptera Terebrantia. Many new species have been discovered, but no attempt is made here to describe any of these, nor even to list unrecorded genera for which the only species found in Australia remain undescribed. The endemic thrips fauna is certainly more diverse than published records indicate. However, 12 of the 14 species newly recorded here are known also from tropical Asia, thus emphasising the southeast Asian component of the Australian fauna.

The following abbreviations have been used: ACT - Australian Capital Territory; ANIC - Australian National Insect Collection, CSIRO, Canberra; NSW - New South Wales; NT - Northern Territory; OAI - Orange Agricultural Institute collection, Orange; QDPI - Queensland Department of Primary Industries collection, Indooroopilly; Qld - Queensland; SA - South Australia; Tas - Tasmania; Vic - Victoria; WA - Western Australia.

Merothripidae

Species in this family are presumed to be fungus-feeding. Three genera are known worldwide, but the only previous Australian records of the family involved three species of *Merothrips* Hood.

**Erotidothrips mirabilis* Priesner. A single female of this species was recognised by John Donaldson, collected in December 1998 at Cairns (Qld) [in QDPI]. It has been taken widely in tropical countries but is known from very few specimens.

Melanthripidae

Considered for many years as a synonym of the Aeolothripidae, this family is currently used to include four genera worldwide (Moritz, Mound and Morris 2001). Two of these genera exhibit classical southern hemisphere distribution patterns. *Dorythrips* Hood is found in South America and Western Australia; *Cranothrips* Bagnall occurs in South Africa and Australia. Females of all species in these genera retain the plesiomorphic condition of the seventh abdominal sternite, with a pair of lobes on the posterior margin that represent the ancestral eighth sternite. All of the species in this family apparently feed on and breed in flowers.

Cranothrips symoni Mound. This species is known only from the flowers of *Brunonia australis* (Apiaceae), a blue-flowered herb that used to be classified in its own monobasic family. Populations have been found on this plant at three widely separated sites, the Simpson Desert (SA), the Hamersley Range (WA) and, during December 2000, at Mendooran in eastern NSW.

Aeolothripidae

Most of the species that are placed in this family are predatory, or at least are facultative predators on other small arthropods in flowers. One species listed here is exceptional in being purely phytophagous.

#*Cycadothrips albrechti* Mound & Terry. This is the third species described in this genus, all breeding only in the male cones of *Macrozamia* (Zamiaceae). *C. albrechti* produces enormous populations in the cones of *M. macdonnellii* in Central Australia. It acts as the pollinator of this plant species and pupates beneath in the soil (Mound and Terry 2001).

#*Mymarothrips bicolor* Strassen. Mound and Marullo (1998) pointed out that the record of the Oriental species *M. garuda* Ramakrishna & Margabandhu

from Darwin (NT) by Mound (1996a), was based on a misidentification of *M. bicolor*, described from Krakatau, Indonesia. These thrips are predatory on the larvae of other thrips species on the leaves of trees.

Thripidae

Two subfamilies are recognised in this family. The first includes the species related to the greenhouse thrips (Mound, Marullo and Trueman 2001) The second includes most of the thrips species that are major pests, including all the tospovirus vectors (Mound 1996b).

Panchaetothripinae

All species in the subfamily appear to be leaf-feeding and are commonly associated with older leaves rather than young leaves. Polyphagy seems to be common in this group, with few of the species known to exhibit particular host associations. Mound (1996a) listed 17 species in 13 genera from Australia in this subfamily; three further genera and species are here recorded from the Australian mainland for the first time.

Anisopilothrips venustulus (Priesner). Widespread, particularly on tropical islands (Mound and Marullo 1996), this species was recorded from Australia on a single female taken in rainforest near Taree (NSW). A second female has been taken recently at the same site and a further female collected near Cape Tribulation in northern Qld.

**Astrothrips tumiceps* Karny. Described from Java and recorded from Pakistan, India, Malaya and the Philippines, Glenn Bellis collected a series of females in August 1999 at Old Arafura, 450 km east of Darwin (NT), that were causing leaf scorching on *Annona muricata* (Annonaceae).

#*Australothrips aliciae* Marullo and Mound. This Northern Territory species appears to be associated only with turkey bush, *Calytrix brownii* (Myrtaceae) (Marullo and Mound 1997). In contrast, the only other member of the genus, *Australothrips bicolor* Bagnall, is widespread across Australia on the leaves of various Myrtaceae, including species of *Eucalyptus*.

**Copidothrips octarticulatus* (Schmutz). Described from Sri Lanka, with synonyms from Taiwan and Kiribati, Mound (1996a) recorded this species from the Australian territory of Christmas Island, under the name *C. formosus* Hood. It has been seen from Pohnpei (Micronesia) damaging kava (*Piper methysticum*) and from Seychelles on crucifer seedlings. At Berrimah Farm, Darwin (NT), it was found in April 1999 causing leaf damage to *Aglaonema* (Araceae), this being the first record from the Australian zoogeographical region.

**Elixothrips brevisetis* (Bagnall). Described from Sri Lanka and subsequently recorded from territories between Taiwan and various Pacific islands, specimens have been studied from Cape Tribulation (Qld). Others are listed [in OAI] from Mt Edith and Mt Spec in northeastern Qld.

Moundothrips apterygus Wilson. This unusual wingless panchaetothripine was described on specimens stated to have been collected from "grasses" at Meningie near the Coorong (SA). However, a visit to the type locality in December 2000 revealed that the "grass" on which this thrips lives is actually a grass-like rush, *Apodasmia brownii* (Restionaceae).

Retithrips javanicus Karny. Described from Java and recorded from Singapore and the Philippines (Reyes 1994), the only Australian record of this species was based on four females collected in the McArthur River area (NT). However, in May 1999 Tony Postle collected one female from *Lagerstroemia* (Myrtaceae) at Broome (WA).

Thripinae

Mound (1996a) listed 124 species in 35 genera from Australia in this subfamily. These species exhibit a wide range of biologies. In some genera, species are associated with the flowers of particular groups of plants, e.g. *Odontothripiella* Bagnall on Fabaceae flowers, *Dichromothrips* Priesner on Orchidaceae and several genera on Poaceae. In other genera, such as *Pseudanaphothrips* Karny, species are associated with flowers of host plants that are only distantly related and, in some genera including *Anascirtothrips* Bhatti, *Dendrothrips* Uzel and *Parabaliouthrips* Priesner, the species live only on leaves.

#Anascirtothrips arafura Mound & Wang. Described from the leaves of *Ficus* (Moraceae) trees on Melville and Bathurst Islands (NT), this is the third member of this genus. Mound and Wang (2000) provided a key to distinguish the three species and also recorded the following species from Australia for the first time.

#Anascirtothrips arorai Bhatti. Described from the leaves of *Ficus* in India and subsequently found on the leaves of *Ficus microcarpa* in Florida, this species was recorded from Australia on specimens collected from *Ficus* on the University Campus at Darwin (NT), in June 2000.

Apterothrips apteris (Daniel). This widespread wingless species is commonly associated with grasses, but has been recorded as a pest of lucerne. However, in coastal California it is associated with the leaves of *Erigeron* (Asteraceae). During 2000 it was found by Margaret Williams damaging a crop of garlic near Hobart (Tas), a host association not previously recorded.

**Arorathrips spiniceps* (Hood). Like other members of this genus and also of the closely related genus *Chirothrips* Haliday, this species feeds and pupates within the florets of grasses and is thus easily transported around the world in grass seeds. Mound and Marullo (1996) record it from several Caribbean countries as well as from the following territories in the Pacific: Hawaii, Solomon Islands and Papua New Guinea. There are females in QDPI and ANIC from Bowen in northeastern Qld.

**Chaetanaphothrips leeuwenii* Karny. Presumably originally from SE Asia, in common with the other members of this genus, this species has been recorded widely around the tropics. In the West Indies it has been found in association with banana crops. The new Australian record is based on two females taken in May 1999 on the Cobourg Peninsula, near Darwin (NT).

#*Dendrothrips diaspora* Mound. Although this species has been taken at various sites across Australia, in WA, Qld and NSW, the plant species on whose leaves it breeds remains undiscovered. Mound (1999) provided a key to distinguish the three members of this genus known from Australia.

#*Dendrothrips glynn* Mound. Based on three females collected at Cairns (Qld), this species is very similar to one from New Caledonia.

#*Dendrothrips howei* Mound. Described from Lord Howe Island from five specimens (Mound 1999), this species was found breeding, in December 2001, on the young leaves of *Xylosma maidenii* (Flacourtiaceae).

Dichromothrips australiae Mound. Previously known only from the type series collected at Kanangra Walls (NSW), this thrips has now been found on the flowers of *Pterostylis atrans* (Orchidaceae) at Mt Franklin (ACT).

**Dichromothrips corbetti* (Priesner). This SE Asian orchid pest has been taken several times at Darwin (NT), causing damage to the flowers of *Vanda* (Orchidaceae). The dark forewings are pale at the base and the tergites have characteristic sculpture laterally, consisting of a series of transverse parallel lines.

Dichromothrips spiranthidis (Bagnall). Described originally on a single specimen from Healesville (Vic), this thrips apparently breeds in the flowers of a range of Orchidaceae. It was collected recently from *Spiranthes sinensis* at Gloucester Tops (NSW) and also near Brisbane (Qld). At Namadgi NP (ACT) it was collected from *Prasophyllum wilkinsoniorum*.

#*Edissa steinerae* Mound. Described on a single female from grasses at Atherton (Qld), this species was also recorded from Thailand and Japan (Mound 1999). The only other member of the genus is from South Africa and Sudan.

Ensiferothrips primus Bianchi. Described from New Caledonia, the previously unknown host plant in that country was established by Bournier and Mound (2000) as *Malaisia scandens* (Moraceae). Substantial populations of this thrips were found recently by Geoff Williams, on the under surface of the leaves of this climber near Taree (NSW).

#*Ensiferothrips secundus* Mound. Described from Lord Howe Island, on one female and four males taken on *Smilax australis* (Smilacaceae), this species differs from the only other member of the genus in lacking greatly enlarged setae on the forewing (Mound 1999).

Hydatothrips argenticinctus Girault. Described on a single specimen, this species has now been collected widely in eastern NSW, breeding on the leaves of the creeper *Parsonsia straminea* (Apocynaceae).

Hydatothrips haschemi Girault. Described from a single female collected on a window, this species appears to be associated with the leaves of various Fabaceae, including *Centrosema* and *Calopogonium*, on which it has been collected around Darwin and also at Kakadu and Larrimah (NT).

**Karphothrips dugdalei* Mound & Walker. Described on a single female from near Auckland, New Zealand, this species is widespread in Australia on the youngest leaves of species of sword grass, *Gahnia* (Cyperaceae). Specimens have been studied from near Albany (WA), near Hobart (Tas), Chichester Dam (NSW) and Monga Forest (NSW). It is a long, slender, yellow thrips, superficially similar to the common grass-living *Aptinothrips* Haliday, but with wings.

#*Leucothrips nigripennis* Reuter. Associated with various cultivated ferns, such as *Pteris cretica*, in various parts of the world, this minute white species with black wings was recorded by Mound (1999) from both Gosford (NSW) and Perth (WA). The other described species in this thripid genus are all from the New World. *L. nigripennis* is probably South American in origin, Brazil being the only country from which it has been recorded outside of cultivation.

**Megalurothrips typicus* Bagnall. Described from Sarawak and recorded from various SE Asian territories including Java, Sumatra and Taiwan, this species differs from the only other member of the genus known from Australia, *M. usitatus* Bagnall, in having the median pair of setae on the seventh sternite arising on the posterior margin, not anterior to this margin (Palmer 1987). The species presumably breeds in flowers of Fabaceae, but Angus Wilson collected several females in the flowers of mango trees at Kununurra (WA), in September 2001.

**Monothrips flavus* Moulton. The only species in this genus is based on a single damaged female, collected from *Saccharum* in Rabaul, New Britain, during 1929. The genus has not been recognisable from its description (Moulton 1940), but one female collected from grasses at Humpty Doo (NT), in May 1999, has now been compared with the holotype on loan from the Bishop Museum, Hawaii and is considered conspecific. The pronotum bears numerous transverse striae, tergites II-VIII each have two or three rows of ctenidia-like microtrichia anterolaterally and a very broad, finely toothed, craspedum on the posterior margin. The sternites have about eight discal setae and a series of stout triangular teeth on the posterior margin laterally. Superficially this thrips looks like a member of the genus *Rhamphothrips* Karny, particularly in the shape of the head and pronotum. However, the chaetotaxy of the seventh sternite is very different from members of that genus (Moritz, Mound and Morris 2001), the median pair of marginal setae

being widely separated and the other two pairs of marginal setae arising near the lateral corners of this sternite.

**Neohydatothrips gracilipes* (Hood). Previously known from the Caribbean area, living on various malvaceous weeds including species of *Sida* (Mound and Marullo 1996), this species has been studied recently from India and Thailand. In northern Australia it has been collected widely on malvaceous weeds between Brisbane (Qld) and Darwin (NT).

Neohydatothrips diana (Girault). Described on a female from Mt Coot-tha, Brisbane, this species has been found breeding on the leaves of *Pultenaea procumbens* and *Dillwynia sieberi* (Fabaceae) around Googong Dam (NSW) near Canberra.

Neohydatothrips haydni (Girault). Previously known only from one of Girault's most damaged specimens, this species appears to be associated with *Swainsonia galegifolia* (Fabaceae), judging from specimens in QDPI. A very similar, if not identical, species was common in Spring 2001 on *Indigofera australis* (Fabaceae) in the coastal forests inland from Batemans Bay (NSW).

#Neohydatothrips samayunkur Kudo. This species was recorded from Australia under the name of a Mexican species, *N. pseudoannulipes* Johansen (Mound, Goodwin and Steiner 1996). However, the available material from Mexico on which this identification was based (Mound and Marullo 1996) subsequently proved to represent two species (Nakahara 1999). It is the second of these two, now recognised as *N. samayunkur* described from Japan, that is the widespread pest of marigold plants and other members of the genus *Tagetes* (Asteraceae). During 1995 this species caused severe damage to cultivated marigolds at Gosford (NSW).

#Organothrips indicus Bhatti. This species, the only fully aquatic thrips, was found at Indooroopilly (Qld) breeding on water hyacinth, *Eichhornia crassipes* (Pontederiaceae). Described originally from India on *Typha* (Typhaceae), it has been recorded widely around the world on other aquatic plants (Mound 2000). The males are wingless, almost larviform and particularly difficult to find amongst the surface mucous of their host plant, beneath water level.

#Organothrips wrighti Mound. Described on a male and a female taken on Melville Island (NT) and two females from near Cape Tribulation (Qld), another female has now been studied that was collected near Cairns (Qld) [in QDPI]. Presumably the species is widespread on grasses or rushes growing near water across northern Australia (Mound 2000).

Parabaliotrips setifer (Karny). Until recently this species has been known only from the type specimen that was collected early in the last century. It has now been found breeding on *Leucopogon lanceolata* (Epacridaceae) at Monga Forest (NSW) and at Walcha (NSW). A further new species of this

genus is currently being described (Gillespie, Mound and Wang 2002), living on the buds of *Ficus macrophylla* (Moraceae) at Sydney (NSW).

Pseudanaphothrips araucariae Mound & Palmer. Described from the male cones of *Araucaria bidwilli* in southern Queensland, this Australian thrips also produces large populations in Queensland in the male cones of at least two species of *Pinus* (Pinaceae). These populations have become so large around Cardwell (northern Qld) that the thrips has become a serious nuisance annually, entering a local school in vast numbers (Mound, Ritchie and King 2002).

Pseudanaphothrips frankstoni (Steele). Previously known only from two females collected in the flowers of blackberries in Victoria, large populations have been found amongst the sori on fronds of the tree fern *Dicksonia antarctica* (Dicksoniaceae) in narrow gullies at Tidbinbilla (ACT).

Pseudodendrothrips darci (Girault). Described from a single female taken at Indooroopilly (Qld), this minute pale species is probably widespread on *Ficus* leaves. In providing a key to the three members of *Pseudodendrothrips* Schmutz from Australia, Mound (1999) indicated that *P. darci* cannot be distinguished at present from the common SE Asian species *P. bhattii* Kudo.

#*Pseudodendrothrips gillespei* Mound. This large dark member of the genus was described from Lord Howe Island on the leaves of *Alyxia ruscifolia* (Apocynaceae). It has recently been recorded from mainland Australia, one female being collected by Geoff Williams near Taree (NSW).

#*Pseudodendrothrips mori* (Niwa). Three females of this pest of mulberry trees were found on a sandpaper fig near Cooktown, northern Qld (Mound 1999). The species has been reported widely around the world, but there is no other Australian record.

**Rhamphothrips pandens* Sakimura. Recorded widely from the Caribbean and across the Pacific to Java, but always in low numbers without good evidence of a specific host relationship, a single female of this species was taken on the Cobourg Peninsula (NT) in May 1999.

#*Salpingothrips aimotofus* Kudo. One female and one larva of this species were collected at Indooroopilly (Qld), but it probably occurs widely across the northern parts of Australia. In China and Taiwan the species is associated with the leaves of the Fabaceae vine, kudzu (*Pueraria*).

Scirtothrips albomaculatus Bianchi. Described from New Caledonia, this species has been taken widely in eastern Australia. Adults have been taken on many different plants, but the species is probably associated with the widespread and variable shrub *Dodonaea viscosa* (Sapindaceae).

Stenchaetothrips biformis (Bagnall). Very few specimens of the oriental rice thrips have been collected in Australia and none from rice crops. However,

the species seems to be well established near Brisbane at Indooroopilly (Qld), judging from a long series of both sexes [in QDPI] taken from reeds along the roadside near the Long Pocket Laboratories.

**Thrips extensicornis* Priesner. Described from Java and recorded from Taiwan and the Philippines, this flower-living species was taken in considerable numbers at Berrimah Farm, Darwin (NT), damaging flowers of *Gardenia* (Rubiaceae) during October 1999. Unlike related species in this large genus, females have only a single pair of discal setae on each abdominal sternite. There is also a series of this species in QDPI, collected at Cairns (Qld) on *Pavetta indica* (Rubiaceae), during November 1985.

Thrips knoxi (Girault). Known previously from one female, this is a common, apparently univoltine species breeding in spring in the flowers of a range of small species of the genus *Lomandra* (Xanthorrhoeaceae). It is less common in the flowers of *L. longifolia* and its cultivars, in which the common eastern flower thrips, *Thrips setipennis* (Bagnall), is frequently abundant. *T. knoxi* is widespread along the east and south coasts from at least Brisbane (Qld) to Adelaide (SA). It is an unusual member of the genus, with a small glandular area on the third sternite in females and a broad-based sensorium on the sixth antennal segment. The number of antennal segments varies between seven and eight.

Thrips nigropilosus Uzel. Records of this minor pest are rare in Australia, but a substantial population was observed by Marilyn Steiner on the leaves of a garden *Achillea* (Asteraceae), at Gosford (NSW), for some months in 1998.

**Thrips novocaledonensis* (Bianchi). This is the dominant member of the genus in a range of flowers in New Caledonia (Bournier and Mound 2000). It is established on Norfolk Island, where it has been found in large numbers in the flowers of *Lantana* and from whence it has been taken in quarantine at Sydney (NSW).

Thrips palmi Karny. This SE Asian species was first collected in Australia at Darwin (NT) in June 1989, then again at Ormiston, Brisbane (Qld) in July 1990 (Houston *et al.* 1991). Since then, John Donaldson has identified the species from various crops at different sites on the Atherton Tableland (Qld), including lettuce, navy bean, capsicum, pumpkin and eggplant. The presence of this species and its dispersal within Australia are usually considered to be due to transmission by the horticultural trade. It is found regularly in quarantine on imported cut flowers such as orchids and translocation internally by the trade in vegetable seedlings is easy. In September 2001, John Moulden collected *T. palmi* at Kununurra (WA) from damaged seedlings of *Lisianthus*. Although inter-state horticultural trade may have caused this, the possibility cannot be discounted that this species is now part of the natural thrips fauna of northern Australia, with populations supplemented by winds from Indonesia.

Thrips parvispinus (Karny). This SE Asian species has been taken widely across northern Australia, on a range of plants but only in low numbers. *T. taiwanus* Takahashi, recorded from Australia by Mound and Gillespie (1997), is now recognised as a synonym of *T. parvispinus* (Mound and Collins 2000). The species is considered to have the potential to become a serious pest. It was recently recorded in Europe for the first time.

Thrips seticollis (Bagnall). Known previously only from the holotype female collected near Perth (WA), this is the only member of the genus to have a pre-apical claw on the fore tarsus. Single females have been collected on three occasions recently in the ACT and another female in Tasmania, all of which share with the holotype this as well as other character states. The host plant is probably a member of the Epacridaceae, but this has yet to be confirmed.

Thrips setipennis (Bagnall). This is one of the most common flower thrips along the eastern coast of Australia. It breeds in the flowers of a wide range of unrelated plants, including *Lomandra* (Xanthorrhoeaceae), *Prostanthera* (Lamiaceae) and *Notelaea* (Oleaceae). Williams, Adam and Mound (2001) indicated that this thrips is the specific pollinator of the small tree *Wilkiea huegeliana* (Monimiaceae) and possibly of other trees in the eastern rainforests.

#Thrips trehernei Priesner. This European species is probably widespread in southeastern Australia, having been taken in the flowers of *Taraxacum officinale* (Asteraceae) at several sites in NSW, ACT and SA (Mound 1998).

Trichomothrips bilongilineatus (Girault). This species was placed in *Trichomothrips* by Mound & Houston (1987) and *Dorcadothrips* Priesner was synonymised subsequently with this by Bhatti (1999). This genus now includes 27 species, mainly from the Old World tropics, but with very little information on biology. Adult females of *T. bilongilineatus* have been taken several times from ferns at Gosford (NSW), although there is no evidence that the species breeds on these plants.

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